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# Handling Ideological Bias and Shifting Validity of Longitudinal Data: The Case of Process-generated Data on GDR Elites

Axel Salheiser\*

**Abstract:** »Ideologisch bedingte Verzerrung und Shifting Validity bei Längsschnittdaten: Prozess-produzierte Daten von DDR-Eliten«. Process-generated data from the vanished East German socialist society offer an in-depth picture of elite recruitment, change of social structure, and societal differentiation. However, in marked contrast to generic survey data or scientific use files derived from other types of process-generated data, in those remnants of GDR administration 1) the ideological “contamination” of various items, and 2) the occurrence of shifting validity has to be observed. Either phenomenon demands special attention in data handling and the interpretation of statistical results. Ideological bias (e.g., the forging of biographical data) is a general problem encountered when analyzing social background or political affiliation of elites, whereas coding errors and missing data are conditional on the administrative body, sector, and hierarchy position the data were assembled from. I shall discuss techniques of validity evaluation and adjustment that have proved helpful while analyzing the Central Cadre Database of the Council of Ministers (ZKDS).

**Keywords:** Process-Generated Data, Mass Data, GDR, Shifting Validity.

## Introduction

Process-generated data from the administrative apparatus of the vanished East German socialist society (German Democratic Republic) and their use in contemporary empirical sociology have been thoroughly portrayed and discussed in earlier contributions to HSR or other publications (cf. Best/Hornbostel 1998, 2003a; Remy 2002, 2003, 2006; Salheiser 2005; Salheiser/Remy/Gebauer 2004; Salheiser 2006a; Gebauer/Salheiser/Remy 2007).

Many of these data are currently being analyzed at Sonderforschungsbereich 580, Jena, Germany. In our research into elites and social structure in the GDR society, we focus on analyses of the Central Cadre Database of the Council of Ministers (*Zentraler Kaderdatenspeicher*, ZKDS).<sup>1</sup> ZKDS comprises detailed

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information on the social backgrounds, political commitment, family relationships, qualifications, vocational trainings, and careers of nearly 700.000 persons from virtually all sectors of GDR society except the communist state party SED, the military, police, and the “Stasi” security service (MfS). Most records in the database refer to high-level personnel from central and regional state organizations, several levels of the centralized economy, or state-owned service and infrastructure facilities. A great variety of variables per case include information about family *milieu*, marital status and social positions of wives/spouses, vocational training, party memberships, honorary decorations, and honorary appointments, among hundreds of other prosopographical and standard-demographic items. Thus, the ZKDS data qualify for both cross-sectional and longitudinal statistical analyses and enable historical sociologists to take a profound insight to the mechanisms of elite formation and social structure development (cf. Best 2008a, 2008b, 2005/2007, 2008d; Hornbostel 1999; Gebauer 2003, 2006; Salheiser 2003a, 2006b, 2008a).

Along with other GDR data such as the comprehensive Database of Societal Manpower (DS GAV), the Manpower Database of Teachers and Educators of the Ministry of Education (*AKDS Volksbildung*), or the Database of the German People’s Police (*DS Volkspolizei*), ZKDS has been preserved in the Federal Archive of Germany which is nowadays located in Berlin-Lichterfelde (cf. Rathje 1996, 1997, 2003).

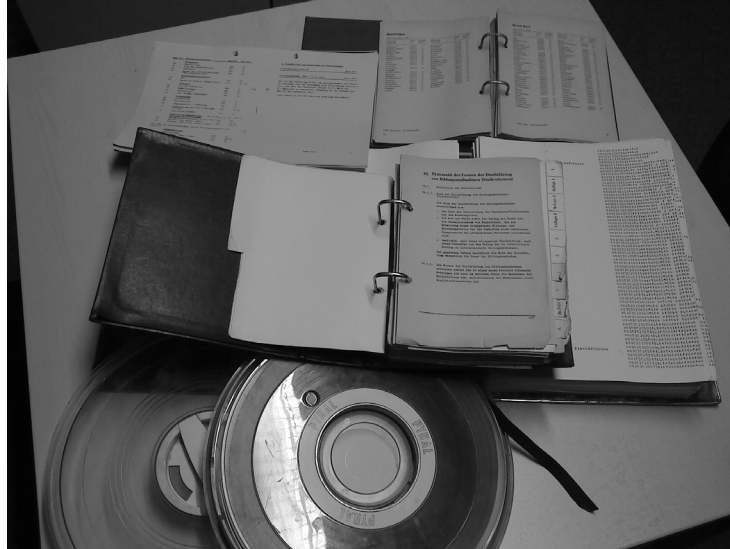
Data documentation and original records on usage and coding practice from data processing centres of the GDR and their related administrative bodies are not exactly scarce. However, decisive details can often only be reconstructed by data inspection and deeper historical studies alone. The original ZKDS tapes as used with the central data processing centre’s mainframe have been copied to modern memory media and decoded to text format. Thus, the database can be handled with modern statistics software such as SPSS, STATA, or TDA.

Because of ZKDS’ unique content, today’s quantitative empirical research into GDR society is no longer confined to small survey samples with limited variable sets as in the past. However, access to such a treasure had its price. Besides the general problems of using process-generated data from administration in science (cf. Müller 1977; Bick/Müller 1984), a number of “GDR peculiarities” had to be taken into account.

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Fig. 1: Original documents, magnetic memory tape as used in the Electronic Cadre Project of the GDR



Of course, a substantial issue of the research practice has been the exploration and validation of data entries. Handling coding errors and missing data rigidly depended on an in-depth historical reconstruction of data collection practice and principles of cadre selection which can only be understood in the light of authoritarian rulership in socialism. Data structure, content, and quality had to be revised and evaluated in order to compensate conceptional gaps and shortcomings, or in order to adapt category schemes to contemporary scientific standards. Furthermore, when interpreting statistical results which have been derived from the ZKDS, it is always necessary to rely on background knowledge about the complex conditions of GDR personnel management, cadre policy, and principles of data merging back then when the database was built up. Empirical analysis itself was preceded by a multi-staged, and rather complicated, work process comprising both manual and automated recoding routines. Below, I shall address a selection of these methodological problems, the theoretical thought associated with error handling, and practical measures for a consolidated data workset.

### Data Mining and Assembly

As the pinnacle of the Electronic Cadre Project of GDR administration, ZKDS was designed as a full sample of the leading personnel of state bureaucracy,

state-owned economy, and infrastructure facilities. However, Party (SED) and security organs, as well as the military (National People's Army, NVA) did not submit data of their personnel to this governmental project; quantitative historical research into these sectors of state therefore relies on external sources (cf. Salheiser 2003b; Gebauer/Salheiser/Remy 2007). Data collection for ZKDS was based on the highly integrated organizational hierarchy of the authoritarian state apparatus with ministries and state secretariates at the top and small local offices, units, or companies at the bottom. Cadre offices (personnel management departments) were liable to digitalize selected information from the personnel files on punched tape or cards. These records were sent to the respective data processing centre of the superior ministry or state secretariate where sectoral manpower databases were compiled.

A further selection of cadres in high or strategic positions, such as heads of government departments, managers, specialists, or business travelers to foreign (Western capitalist) countries, was merged to the ZKDS. Inspections of data completeness, periodical updates, and annual backups of the database were made in the data processing centre at the Council of Ministers in East Berlin. Access to the database was restricted to the highest levels of government which used it for periodical statistical reports on the shares of CP members, working-class backgrounders, and women among functionaries of state predominantly. In 1990, the Electronic Cadre Project was stopped with the political turnover in the GDR.

Because of serious technical restrictions, ZKDS split into a multitude of smaller workfiles on tape which have been stored as separate files on CDR in the Federal Archive until this day. It is only due to modern computing capacities that the giant database can be (virtually) handled as a whole. When the Jena research project on "Functional Elites and Societal Differentiation in GDR Society" started, considerable effort was made testing, sorting and matching all existing subfiles (cf. Wittig 2003). All available annual updates of the database were integrated to this matching process in order to achieve the maximum number of cases in the masterfile. This would also enable better analyses of elite fluctuation, job rotation, and positional mobility. As the vast majority of individuals appeared in more than one annual backup, redundant *doublettes* had to be identified and deleted (up to 90 % of the "rough cases"). Only the best representations of cases were selected for the masterfile. This was done with regard to both quantity and accuracy of stored information. The contemporary version for scientific use preserves the original structure of individual cases, even though they are anonymous for reasons of informational security. Case distinctiveness was maintained by generating pseudo-IDs.

Genuine sociological analysis, however, focuses on higher aggregate levels. In the case of GDR research, one would prefer to analyse large subsamples i.e., collectives of functionaries of a certain rank or position, or even the entire personnel from one ministry or societal sector. Therefore it was useful to em-

ploy test routines that cover large subsamples and include checks of the represented number of cases in comparison with the actual personnel structure of the respective government body or organizational unit of economy. Along with the ZKDS documentation, statistics from local, regional and central cadre bureaus could be evaluated. Sad enough, official GDR publications (such as the Annual Statistical Reports, *Statistische Jahrbücher*) have hardly been proven helpful when comparing personnel figures in detail, because they are inaccurate or employ rather large categories. Another major difficulty was the complexity and the historical change of organization structures.

Fig. 2: Edited ZKDS masterfile in SPSS

	v1903	v1904	v1905	v2001	v2002	v2003	v2004	v2006
1	5845509	15	1103	6507	22	9999	410	83
2	6112008	99	1231	6507	22	9999	410	79
3	7017002	15	1331	6507	22	0	410	76

Thus, a profound study of printed sources in the Federal Archive, its subdivision of documents from GDR Party and mass organizations (SAPMO-DDR), and in a variety of regional and local archives has been accompanying the process of data editing and validation for years. For instance, political-ideological guidelines had to be contrasted with records and manuscripts from personnel departments in order to explain why certain cadre groups or variables had been preserved as part of the data base while others vanished over the years. Asking to what extent the goal of full sampling (according to government regulations and definitions) had been achieved, and enabling a correct evaluation, historical research reconstructed large parts of the Electronic Cadre Project in detail. ZKDS had been a decennial work in progress that had occupied hundreds of experts: Now it became itself a study case of socialist bureaucratic rulership and the pitfalls of authoritarian centralism.

It is not appropriate to consider today's ZKDS masterfile a completely explored and secured data source that is fully at eye-level with genuinely scientific surveys with regard to contemporary standards of sampling theory and methodology. Even the most extensive endeavours of editing and correction could not fully compensate all shortcomings. However, an essential, solid foundation of quantitative studies of socialist elites has been provided.

## Compatibility and Translation of Categories

The variable programme and categories used in the ZKDS and most other process produced mass databases from the GDR are based on the Central Office of Statistics' National Economic Manpower Systematics (*Volkswirtschaftliche Arbeitskräftesystematiken*, VAKS). They breathe the spirit of Marxist and Leninist sociology and, thus, offered a good opportunity to explore a multitude of socio-economic, socio-political, educational and generational factors of social reality in socialism. Also, most items could be rather easily recoded into variables that meet modern sociological survey standards. This did, however, not apply for complex variables such as the contents of vocational training, the systematics of special skills, or the rank, position and function. The latter variable, comprising almost 3.000 different codes, had little in common with Western ISCO standard and was "shrunk" to an eight-level positional scale that corresponds with sector peculiarities, thus enabling analyses of vertical and horizontal career mobility.

Some variables had to be handled more careful because they carry the brandmark of Cold War ideology. For instance, categories of pre-GDR political past contained membership in the so-called "Fascist Wehrmacht", in the French Foreign Legion, and in the West German *Bundeswehr* (for West-East-movers) in the same variable. A rather difficult subject are variables that easily produce artifacts when being oblivious to ideological bias because their categories might not contain what they should: Cadre policy demanded or abetted an opportunistic "arcane" coding practice that, moreover, varied over time. Strategies of handling ideological bias shall be discussed farther below.

## Detecting and Handling Shifting Validity

Entry gaps and implausible missings are among the most obvious disadvantages of process-generated data from the GDR. The heterogeneity of data quality, or poor data quality, is partially caused in the hypercomplexity of the process of central data collection. It is necessary to keep in mind that the ZKDS was a database fed by a multitude of lower-level, or decentral, databases. Not quite patchwork-type and highly standardized, the ZKDS still expressed the Herculean task of full-sampling the upper echelons of an entire modern industrial society. This had to be done with early 1980's interfacing technology and a strictly limited mainframe memory that complicated automated writing, sorting, correcting and proof-reading of entries.

Another important source of heterogeneity was the particularistic interests of ministries, offices or organizations in electronic personnel management and monitoring. As a rule, the organizations in question tried to satisfy their own needs in the first place and often met central expectations only half-heartedly. The high level of integration typical of authoritarian societies caused certain

coordination problems that could partly be overcome as the electronic cadre project moved on throughout the 1980s, but it left marks in the data preserved today.

In addition, a considerable number of organizations and companies were not *able* to reach compliance with the official regulations of data collection due to their restricted organizational resources. Some companies were even reluctant to report their personnel to the superior hierarchy in fear of labor piracy by other state-owned enterprises. Such background knowledge must be available while preparing cross-sectoral statistical analyses in order to prevent artifacts and misinterpretations.

The heterogeneity of data quality is also partially rooted in the so-called “arcane cadre politics” of socialist state authorities and the ideological demands of a bureaucracy that failed to reform cadre statistics because, in the first place, it was reluctant to abandon outdated principles of personnel recruitment. Traditional cadre traits such as working-class background (or not) or party alignment were monitored and subsequently occupied computing memory and other resources, albeit the communist party SED rhetorically embraced technological modernization and rationalization.

As a rule, data of holders of strategic positions, such as higher-ranking members of government or the apparatus, were better recorded, checked and maintained than data from lower-level personnel. Moreover, a centre-peripheral-differentiation between sectors can be noticed, marking the political or economical importance of monitoring their functional elites. On the one hand, data from cadres in export industries (e.g., micro electronics) or the educational system (Margot Honecker’s *Ministerium für Volksbildung*) mostly comprise detailed information on both political and professional traits. Standard-demographic variables often show no missing values or only a few; time-based data cover the complete biographies. On the other hand, in subsamples from domestic trade, national tourism, or the insurance and banking sector, cases only contain a minimum of necessary information which reflected their relative strategic unimportance. Some offices or companies only submitted data of their management, while others embraced the project fully and even reported all their employees, workers and lower servicemen. For cross-sectional and cross-positional statistics, techniques such as systematic or randomized subsampling offered adequate ways to avoid distortion. Nevertheless, some cases in the database cannot be included in certain types of analysis because they bear too little useful information or completely lack biographical data. With a selection of well-written and maintained cases from subelite personnel, comparative analysis can carefully circumnavigate the dangers of shifting validity. As a footnote, some variables have been filled and maintained so poorly, that the general disregard unmasks their lack of practical meaning.

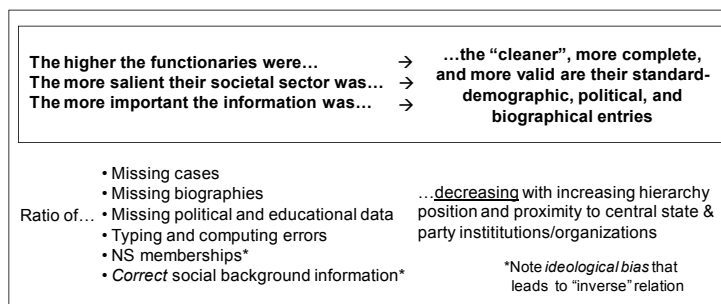
But shifting validity is Janus-faced, being a typical phenomenon which reveals the double nature immanent to process-generated data. Not only do they



depict (scientifically welcome or unasked) captures of social reality, they also indirectly reproduce administrative action, policy, and ideology. With ZKDS, the hierarchical dimension of data completeness does not automatically imply a truthful depiction of social reality in the “best kept” cases. Quite contrary, there is some evidence that systematic or occasional forgery of data entries concentrates on top-level strata. This is mostly related to the ideological “contamination” of certain variables and the general predominance of ideology in socialist cadre theory, practice, and the process logic of bureaucracy. To some extent, ideologically undesired information was most probably not submitted to ZKDS correctly because it made a negative cadre trait. Examples for this are *bourgeois* family background and a former affiliation of older cadres with National Socialist organizations (cf. Best/Salheiser 2006). One cannot reconstruct whether old entries had been cleansed rewarding good conduct, or cadres themselves lied, whether lower-level cadre bureaus feared their superiors’ criticism, or a mixture of these motives applied. Moreover, ideologically undesired information was apparently censored or changed on the very top of the hierarchy in order to white-wash even the internal cadre statistics – trying to secure legitimacy and to avoid Western muckraking.

In sum, experiences of shifting validity in ZKDS led to the introduction of some simple rules of interpretation that are indispensable when handling and inspecting data from authoritarian administration. They can be applied to all GDR mass data and will probably also prove helpful in the interpretation of similar statistics from other dictatorial societies, if available.

Fig. 3: Shifting validity in process-generated mass data from the GDR



## Ideological Bias

Tracing the described manipulations in the data is impossible without external sources. First evidence was delivered by a systematic comparison between the official entry on social background and (hand-written or typed) CVs of CP secretaries in regional Party archive records. A substantial discrepancy between

alleged and real statuses (cf. Salheiser 2008b) had been previously suggested or implied by single case studies and several findings of oral history.

In general, working-class background (*soziale Herkunft aus der Arbeiterklasse*) of cadres was often favored or demanded, but far from imperative or self-evident at any rate (cf. Best 2003b). Not only among managers, physicians, or academic personnel (cf. Salheiser 2007) the share of cadres from *bourgeois* and *intelligentsia* families was considerably high. This shows that a working-class background was not needed to embark on a cadre career. However, in certain periods of history and in certain sectors, it was an important advantage.

A source of uncertainty, the extent of forged entries on social (family) background in ZKDS can only be estimated. Since most functional elites ranked lower than the CP secretaries whose documents we scanned, and a bourgeois family background was not such a big issue for them, it is possible that forgery was rarer in the overall database. A relatively low socio-political status hardly gives reason to question the correctness of a “workingclass background”. However, data of high-ranking cadres were prone to white-washing for purposes already discussed above.

More or less subtle manipulations of the same scheme also had to be suggested with regard to cadres’ “stained” past from the anti-fascist socialist perspective. There is evidence that a former NSDAP membership was erased from the records when the cadre held a high-ranking position. However, some cadres lost their position in the 1970’s and 1980’s with explicit reference to a former NSDAP or SS membership, although authorities had known this detail since the postwar period.

As preparations for new publications on top-level CP and state cadres are starting, and new external sources are being made available, it is already possible to announce better estimations and promising insights. To this day, however, documented experience of handling and interpreting forged GDR data is still scarce.

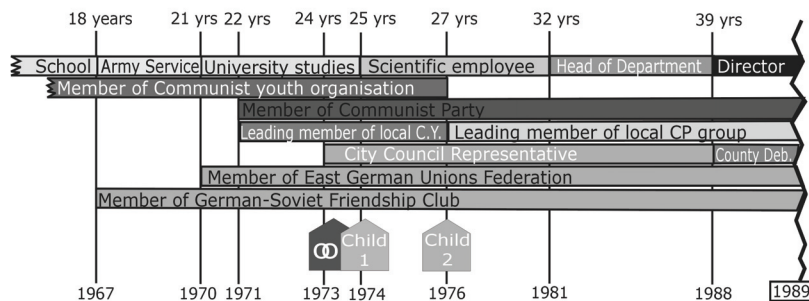
## Correcting and Recoding Time-Based Biographical Data

Educational, vocational and political biographies of high-ranking cadres are meticulously reproduced in ZKDS. Even for lower-ranking personnel, an astonishing variety of information is available. Thus, with regard to time-based variables such as year of filling a position, graduating from university, joining the CP etc., the data qualify for progressive longitudinal analyses such as Event History and Multi Level Modeling (cf. Gebauer 2008) or Sequence Pattern Analysis/Optimal Matching (cf. Salheiser 2008b). In the Jena SFB project, career information is used to trace mechanisms of GDR elite selection, long-term changes of social structure, and state intervention.

As the ZKDS masterfile is a generic rectangular data matrix with one case/one line, career information and covariate variables had to be transformed into episode data structure, followed by routines of sorting and correcting episodes. The plausibility of entries was checked according to biographical logic, time order, or employing detailed knowledge about the historical social framework that defined GDR life courses and cadre careers (*Laufbahn*).

Entries on the worklife and societal (political) and private biographies of functionaries had to be orderly separated if merged in variables. Although political offices, studies and steps of secondary vocational training belonged to respective special sets of time-based variables, in some cases this information could be found in variables reserved for professional career steps, which was contrary to regulations. Sorting by years ascending was essential; a practical example for this being positions that were filled earlier than other positions throughout the career but whose information was coded in a wrong place in the variable grid as if they had been filled later. Furthermore, some episodes had to be shortened because their overlapping with others was an obvious coding error. To a great part, worklife episodes had to be artificially extended until the starting time of follow-up episodes in order to close implausible gaps in the vocational biography. The correction of time-based data also included left-censoring of starting time variables, for instance when state functionaries had entered their position, according to original coding, at the *alleged* age of 10-18. With regard to such problems, multiple frequency tables, case-to-case comparisons and assumptions of probability eventually allowed to construct accurate subfiles for Event History Analysis.

Fig. 4: Episodes of a cadre biography in longitudinal data structure: Director of a state-owned company, born in 1949 (idealized for demonstration purposes)



## Conclusion

Poor or partial completeness of entries, inhomogeneous data quality, shifting validity, and ideological bias of variables or categories are the pitfalls in the analysis of process-generated GDR data. In marked contrast to scientific survey data, which were originally designed for research purposes, ZKDS demands a painstaking observation of data structure, coding practice and sectoral or hierarchical peculiarities. However, due to the depth and richness of available information, the database holds an amazing potential for the empirical historical sociology of socialism and elite studies.

Encountering validity problems related to hierarchical and sectoral differences, multiple comparisons and careful source critique helped to establish rules of interpreting missing values or implausible information. Also, methods of reconstructing lost data were broadly applied. With regard to ideologically biased variables, categories had to be revised and recoded. Estimations of systematic or occasional forgery of entries became possible by comparisons with external sources.

Convincing results in the analysis of longitudinal data could be achieved by applying rules of coding, recoding, and completion. These were based on logical assumptions and the background knowledge about educational, vocational and political biographies of GDR elites.

Today, ZKDS is a powerful instrument of research into modes of elite recruitment, advancement, differentiation, and the framework of socio-structural change in late state socialism. Institutional and generational change in GDR history is embedded into the broader context of modernization and the development of the German society in the twentieth century (cf. Gebauer/Salheiser 2008). Revised and validated process-generated databases such as the ZKDS offer the opportunity to put retrospective quantitative research into socialism on a firm footing because it meets high methodological demands.

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